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10/685,135	10/14/2003	James M. Minor	10030524-1	4483

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EXAMINER	
MOTSINGER, SEAN T	

ART UNIT	PAPER NUMBER
2635	

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/685,135	MINOR, JAMES M.	
	Examiner	Art Unit	
	Sean Motsinger	2635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-15,18-25,27-41,43 and 45-51* is/are rejected.

7)☒ Claim(s) *7,16,17,26,42 and 44* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/14/03,5/17/04,3/29/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Objections to the Specification

1. The use of the trademark Microsoft Excel has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

2. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

3. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code (see paragraph 91). Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Objections to the Claims

4. Claim 12 objected to because of the following informalities: Banding lacks antecedent basis. For the purposes of examination examiner believes that claim 12 was intended to depend from claim 11 not claim 10. Appropriate correction is required.

5. Claims 7,16-17,26,44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Rejections Under 35 U.S.C. 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to the examiner how the mean, median or standard deviation of a subset depends on its location (ie. banding) as mandated by Claim 12.

Rejections Under 35 U.S.C. 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim 1-5, 9, 15, 18-21, 23-25, 27, 29-34, 37, 41, 45-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al US 6,245,517 hereinafter "Chen".

8. Re Claim 1, Chen discloses, a method for obtaining quality output signals from a chemical array image, said method comprising the steps of

9. rank ordering the output signals from the chemical array image according to signal magnitude; and (see column 6 lines 1-10 and 20-30) Note to sum the ranks of the pixels you must rank order the pixels first.

10. identifying a subset of the rank ordered output signals which are representative of the quality signals. (see column 6 lines 35-40)

11. Re Claim 2, Chen further discloses wherein said chemical array image is of a micro-array (see figure 3). Note that the term array and micro-array were explicitly defined in the specification with the same definition. So no real limitation is added here expect for the fact that features may be present on the micro-array.

12. Re Claim 3, wherein the chemical array image is subdivided into pixels, and each ranked output signal is a signal representing output from a pixel. (See column 6 lines 35-40)

13. Re Claim 4, wherein said identifying a subset is performed using a filter. (column 6 lines 1-50) Note the provided method is a type of filter.

14. Re Claim 5, wherein the chemical array image is broken down in to subunits, and coordinates of a location of each subunit of the chemical array image are maintained with the signal values even after said rank ordering. (See column 5 lines 1-10) Note Chen describes using the locations subsequent to segmentation.

15. Re claim 9 Chen further discloses identifying a background subset comprising a subset of the rank ordered output signals having the lowest magnitudes. (see Column 6 lines 23-25) Note the background is identified and these pixels will be of lower magnitude then the signal.

16. Re Claim 15 Chen further discloses subtracting an average signal value of said background subset from an average value of the target site (i.e. said subset representative of the high quality signals). (See column 6 lines 48-52) Note a median is a type of average.

17. Re claim 18 Chen further discloses forwarding a result obtained from the method of claim 1 to a remote location. (see column 16 lines 25-32) Note here tasks are preformed remotely so some kind of result must be forwarded to a remote location.

18. Re claim 19 Chen further discloses transmitting data representing a result obtained from the method of claim 1 to a remote location. (see column 16 lines 25-

32) Note to send data over a communication network It must be transmitted in some form.

19. Re claim 20 Chen further discloses receiving a result obtained from a method of claim 1 from a remote location. (see column 16 lines 25-32) Note here tasks are preformed remotely so some kind of result must be received at some remote location.

20. Re Claim 21 Chen further discloses wherein the chemical array image is taken from a micro-array. Please note that no further limitation from claim 1 is added as micro-array and array are defined as the same word in the specification.

21. Re Claim 23 Chen further discloses, the steps of: providing a micro-array divided into a grid of regions estimated to each contain a feature, wherein each said region is broken down into pixels (ie. subunits) that cover an entire surface of the region and only a portion of the subunits cover an area on which the feature may exist; and reading all subunits of a region to obtain an output signal for each said subunit; (see column 4 lines 63-68 and column 5 lines 15-25) Note that the target mask defines where a region could exist.

22. wherein said rank ordering and identifying are performed with regard to the region having been read. (See Column 6 lines 15-25) Note the pixels have to be recived (i.e. read) from somewhere before they can be used.

23. Re claim 24 Chen further discloses wherein said subunits comprise pixels. (see column 4 lines 63-38)

24. Re Claim 25 Chen further discloses iterating said reading and rank ordering steps for at least one additional region. (see column 4 lines 63-38). Note Chen is segmenting target sites, which implies the procedure is occurring more then once.

25. Re claim 27 Chen further comprising locating said grid to define said regions. (see column 5 lines 32-39.)

26. Re Claim 29 Chen discloses A geometrically independent method of selecting quality signals from a micro-array feature said method comprising the steps of: (see column 6 lines 12-40) Note the method is geometrically independent in that once you have defined a circular search window pixels are segmented independent of geometry.

27. reading output signals over a target patch (ie the entire surface of a feature and over a predefined background region surrounding the feature); (see column 4 lines 63-68)

28. maintaining coordinates of each location from where each output signal originated during said reading, in association with the read output signals; (see

column 5 lines 1-10) Note Chen describes using the locations subsequent to segmentation.

29. rank ordering the output signals according to signal magnitude; (see column 6 lines 1-10 and 20-30) Note to sum the ranks of the pixels you must rank order the pixels first.

30. and identifying a subset of the rank ordered output signals which are representative of the high quality signals. (see column 6 lines 35-40)

31. Re Claims 30-45, note that 35 U.S.C. 112 6th paragraph was invoked here and for claims 30-45. After referring to the specification the means was determined to be the CPU configured with the appropriate software to perform these functions. Note that Chen also implements his method on a computer system (see figure 9). I will show for the relevant claims that the function is found and therefore the appropriate software and hardware for the means will be present.

32. Re Claim 30 Chen discloses a system for obtaining quality signals from a chemical array image, said system comprising:

33. means for rank ordering the output signals from reading the chemical array image, according to signal magnitude;

34. and means for identifying a subset of the rank ordered output signals which are representative of the quality signals. (see rejection for claim 1)

35. Re claim 31 Chen further discloses, wherein the chemical array image is subdivided into subunits, and wherein each subunit is represented by an output signal. (See column 4 lines 63-67) Note the image is divided into pixels which are subunits.

36. Re Claim 32 Chen futher discloses wherein said subunits comprise pixels. (See column 4 lines 63-67)

37. Re Claim 33 Chen further discloses, reading output signals from the chemical array image. (See column 6 lines 1-50) Note the pixel values must clearly be obtained (read) from somewhere for this algorithm.

38. Re claim 34 Chen further discloses, maintaining coordinates of a location from which each signal originated on the chemical array image, in association with said output signals, even after said rank ordering. (see column 5 lines 1-10) Note Chen describes using the locations subsequent to segmentation.

39. Re claim 37 See rejection for claim 9.

40. Re claim 41 Chen further discloses comparing said output signals with output signals of a second channel to check for misalignment of channels of a two channel

system. (see column 6 lines 50-60) Note checking for variations in intensity at pixel locations constitutes checking for misalignment.

41. Re claim 45 Chen further discloses locating a grid to define target patches (ie regions) on the chemical array image, each target patch designed to include a feature. (see Column 5 lines 30-40)

42. and wherein said means for rank ordering and means for identifying process the chemical array image a region at a time. (see column 6 lines 1-50) Note each target patch is processed individually.

43. Re claim 46 See rejection for claim 1. (see column 16 lines 33-64 and claim 9) Note that the method of Chen is implemented on software.

44. Re claim 47 Chen further discloses wherein the chemical array image is subdivided into regions, and said rank ordering and identifying are performed upon a regional basis. (See column 5 lines 30-40)

45. Re claim 48 Chen further discloses wherein each region is subdivided into subunits, each said output signal being associated with one of said subunits, respectively. (see Column 4 lines 63-67) Note pixels are subunits.

46. Re claim 49 Chen further discloses wherein said subunits comprise pixels. (see Column 4 lines 63-67)

47. Re claim 50 Chen further discloses wherein coordinates of locations on the chemical array image from where said output signals were produced are maintained with the signal values even after said rank ordering. (see column 5 lines 1-10) Note the locations are maintained after segmentation.

48. Claims 1-6, 8-12,14,18-25, 27-40, 43, 45 46-51 are rejected under 35 U.S.C. 102(e) as being anticipated by Shams et al. US 6,731,781 hereinafter "Shams."

49. Re Claim 1 Shams discloses a method for obtaining quality output signals from a chemical array image, said method comprising the steps of:

50. rank ordering the output signals from the chemical array image according to signal magnitude; (see column 15 lines 35-45 and figure 15 A and B) Note that the histogram is rank ordering as it arranges the pixels according to rank of their magnitude.

51. and identifying a subset of the rank ordered output signals which are representative of the quality signals. (see column 16 lines 40-45)

52. Re Claim 2 Shams further discloses wherein said chemical array image is of a micro-array feature. (see column 6 lines 40-50)

53. Re Claim 3 Shams further discloses, wherein the chemical array image is subdivided into pixels, and each ranked output signal is a signal representing output from a pixel. (see column 16 lines 40-45) Note the pixel values are the histogramed (ranked) output signals.

54. Re Claim 4 Shams further discloses, wherein said identifying a subset is performed using a filter. (see column 16 lines 40-45) Note this is a type of filtering.

55. Re Claim 5 Shams further discloses, wherein the chemical array image is broken down in to subunits, and coordinates of a location of each subunit of the chemical array image are maintained with the signal values even after said rank ordering. (See column 17 lines 4-25) The locations of the pixels must be maintained to do this type of operation.

56. Re Claim 6 Shams further comprising plotting the output signal magnitudes versus rank order numbers on a two-dimensional plot. (See figure 15) The plot shows magnitude on the x-axis and rank order is seen in terms of how many pixels are in each bin.

57. Re claim 8 Shams further discloses identifying a contamination (ie residue) subset comprising a subset of the rank ordered output signals having magnitudes larger than the quality signals subset. (see column 16 lines 34-36)

58. Re Claim 9 Shams further discloses identifying a background subset comprising a subset of the rank ordered output signals having the lowest magnitudes. (see column 16 lines 44-46)

59. Re Claim 10 Shams further discloses, identifying a undefined (ie corona) subset comprising a subset of the rank ordered output signals having transitional magnitude values between the values of said background subset and said subset having the high quality signals. (see column 16 lines 40 –45) Note the subset of pixels that is above the HBL threshold and below the HSL threshold but outside the circle isincluded in the undefined section. There for the undefined is a subset which comprises at least some signals having transitional magnitude between the values of said background subset and said subset having the high quality signals.

60. Re Claim 11 Shams further discloses, identifying banding of subunits by comparing the rank order of the subunit signal outputs with said coordinates of the subunits. (see column 18 lines 23-40) Note that to find the ellipticity of the signal one would have to compare the coordinates to the rank order (ie identifying banding).

The rank order is compared in that only the signal (ie quality output) is used in determining the ellipticity.

61. Re claim 12 Shams further discloses, producing diagnostics based on results of said banding identification. (see column 18 lines 23-40) Note ellipticity is disclosed as a diagnostic.

62. Re Claim 14 Shams discloses wherein said producing diagnostics includes at least one of calculating a mean, median or other estimate of signal values in at least one of said subsets (see column 17 lines 30-35), and calculating a standard deviation of signal values in at least one of said subsets (see column 20 lines 6-11). Note that these diagnostics are not dependent on the banding, however banding would have no effect on standard deviation or mean in applicant's invention either.

63. Re claim 18 Shams further discloses forwarding a result obtained from the method of claim 1 to a remote location. (see column 9 lines 60-65) Note here tasks are preformed and communicated remotely so some kind of result must be forwarded to a remote location.

64. Re claim 19 Shams further discloses transmitting data representing a result obtained from the method of claim 1 to a remote location. (see column 9 lines 60-65)

Note to send data over a communication network it must be transmitted in some form.

65. Re claim 20 Shams further discloses receiving a result obtained from a method of claim 1 from a remote location. (see column 9 lines 60-65) Note here tasks are preformed remotely so some kind of result must be received at some remote location.

66. Re Claim 21 Note Array and Micro-array are defined as equivalent in the specification no new limitation is added. See rejection of claim 1.

67. Re claim 22 Shams further discloses comparing an average signal value from a first predefined subset made up of the Backround (ie lowest signal values) in the rank ordering with an average signal value from a second predefined subset made up of the high signal values (contamination) in the rank ordering to determine whether a predefined signal difference level is present. (see column 19 and 20 lines 67-68 and 1- 10) Note this difference is capable of the intended use of determining whether a predefined signal difference level is present. The sets were predefined before the calculation by sham's selection of background and contamination.

68. Re Claim 23 Shams further discloses providing a micro-array divided into a grid of segmentation windows (ie regions) estimated to each contain a feature wherein

each said segmentation windows is broken down into pixels (ie subunits) that cover an entire surface of the segmentation windows and only a portion of the subunits cover an area on which the feature may exist; (see column 6 lines 30-50 column 12 lines 25-35 see figure 6 segmentation window)

69. and reading all subunits of a region to obtain an output signal for each said subunit; (Column 16 34-46) Note all the pixels are classified so they all must be read.

70. wherein said rank ordering and identifying are performed with regard to the region having been read. (Column 15 lines 40-45, Column 16 lines 34-46) Note the rank ordering is done with regard to the region.

71. Re claim 24 Shams further discloses wherein said subunits comprise pixels. (see column 6 lines 30-50)

72. Re Claim 25 Shams further discloses iterating said reading and rank ordering steps for at least one additional region. (see column 20 lines 5-10) Note Shams suggests doing this for multiple windows so multiple windows must have been processed.

73. Re Claim 27 Shams further discloses locating said grid to define said regions. (see column 14 lines 47-50)

74. Re Claim 28 Shams further discloses wherein said locating comprises providing at least one mathematical probe to converge on the grid points (i.e. features) of the array, (see Column 13 lines 5-10) Note the analysis of the rows and column converges on the grid points.

75. calculating a distance between features having been converged on, (See column 14 lines 47-54) Note the width of the columns and rows is also the distance between features.

76. and calculating a size of said regions said size being sufficient to completely contain a single feature. (See column 14 lines 47-54) Note since the window is the width/length of the row/column it will be large enough to contain the entire feature.

77. Re Claim 29 Shams a geometrically independent method of selecting quality signals from a micro-array feature, said method comprising the steps of: (see figure 17 and column 15 lines 40-45) Note applicants histograming (rank ordering) assumes no explicit shape for the quality signals therefore it is geometrically independent.

78. reading output signals over the entire surface of a feature and over a predefined background region surrounding the feature; (see column 16 lines 27-46) Note that that all pixels are classified so they all must be read at some point.

79. maintaining coordinates of each location from where each output signal originated during said reading, in association with the read output signals; (see

column 18 lines 27-39) Note to perform this operation the location of the pixels must be known.

80. rank ordering the output signals according to signal magnitude; (see column 15 lines 40-50)

81. and identifying a subset of the rank ordered output signals which are representative of the high quality signals. (see column 16 lines 40-45)

82. Re Claims 30-45, note that 35 U.S.C. 112 6th paragraph was invoked here and for claims 30-45. After referring to the specification the means was determined to be the CPU configured with the appropriate software to perform these functions. Note that Shams also implements his method of analyzing an array image on a computer system (see figure 4). Examiner will show for the relevant claims that the function is found and therefore the appropriate software means are present.

83. Re Claim 30 see rejection for claim 1.

84. Re Claims 31-32 see rejection for claim 2.

85. Re Claim 33 Shams further discloses means for reading output signals from the chemical array image. (see column 16 lines 27-46) Note that that all pixels are classified so they all must be read at some point.

86. Re claim 34 Shams further discloses, means for maintaining coordinates of a location from which each signal originated on the chemical array image, in association with said output signals, even after said rank ordering. (see column 18 lines 27-39) Note to perform this operation the location of the pixels must be known.

87. Re Claim 35 see rejection for claim 6.

88. Re claim 36 see rejection for claim 8.

89. Re claim 37 see rejection for claim 9.

90. Re claim 38 see rejection for claim 10.

91. Re claim 39 see rejection for claim 11.

92. Re claim 40 see rejection for claim 12.

93. Re claim 43 see rejection for claim 22.

94. Re claim 45 Shams further discloses locating a grid to define regions on the chemical array image, each region designed to include a feature (see column 14 lines 48-55), and wherein said means for rank ordering and means for identifying process the chemical array image a region at a time. (see column 15 lines 40-45) This processing is done for one region at a time.

95. Re claim 46 Shams discloses a computer readable medium carrying one or more sequences of instructions for obtaining quality output signals from a chemical array image, wherein execution of one or more sequences of instructions by one or more

processors causes the one or more processors to perform the steps of: (see column 9 lines lines 40-45) Note Shams's method is implemented in software which must be on a computer readable medium.

96. rank ordering the output signals according to signal magnitude; (see rejection for claim 1)

97. and identifying a subset of the rank ordered output signals which are representative of the quality signals. (See rejection for claim 1)

98. Re claim 47 Shams further discloses, wherein the chemical array image is subdivided into regions, and said rank ordering and identifying are performed upon a regional basis. (See column 14 lines 48-55 and column 15 lines 40-47)

99. Re claim 48 Shams further discloses wherein each region is subdivided into pixels (ie subunits), each said output signal being associated with one of said pixels, respectively. (See column 14 lines 48-55)

100. Re claim 49 Shams further discloses wherein said subunits comprise pixels. (See column 14 lines 48-55)

101. Re claim 50 Shams further discloses wherein coordinates of locations on the chemical array image from where said output signals were produced are maintained

with the signal values even after said rank ordering. (see column 18 lines 27-39) Note to perform this operation the location of the pixels must be known.

102. Re claim 51 Shams further discloses plotting the output signal magnitudes versus rank order numbers on a two-dimensional plot. (See figure 15) The plot shows magnitude on the x-axis and rank order is seen in terms of how many pixels are in each bin.

Allowable Subject Matter

103. Claims 7, 13, 16, 17 26, 42, and 44 contain allowable subject matter. Claim 7 contains allowable subject matter because although Shams shows taking the slope of a plotted subset of the rank ordered signals however he does not determine relative quality based on said slope. Claim 13 contains allowable subject matter because the radius of gyration was not computed in Shams or Chen. Claim 26 contains allowable subject matter because neither Shams nor Chen compare the coronas of the two signals to cheek for color alignment. Claim 44 contains allowable subject matter because neither Shams nor Chen compare the coronas of the two signals to cheek for color alignment. Claim 17 and 42 contain allowable subject matter because the comparing the signals is not done based on the rank order. Claim 16 contains allowable subject matter because rank neither Shams nor Chen

does the rank ordering for each particular channel note Chen ranks the overall intensity not that of each particular channel.

Conclusion

104. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean Motsinger whose telephone number is 571-270-1237. The examiner can normally be reached on M-F.

105. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin Lateef can be reached on 571-270-1245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

106. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Motsinger
11/27/2006

DANIEL SWERDLOW
PRIMARY EXAMINER